Izaac Laundry Mottiar

3B Mechatronics Engineering University of Waterloo

905-341-0341 imlaundr@uwaterloo.ca LinkedIn

I'm currently in my third year of Mechatronics Engineering at the University of Waterloo, specializing in electrical systems. Feel free to explore my portfolio to learn more about the projects I've worked on.

Technical Skills

Electrical: Experienced in circuit and PCB design, leveraging STM32, Arduino, and Raspberry Pi platforms.
Programming: Fluent in Python, C/C++, MATLAB, MS Excel, JavaScript, CSS with experience in OpenCV.
Mechanical: Skilled in AutoCAD, SolidWorks, and Fusion 360, with experience in 3D Printing and Machining

Work Experience

UW Robotics Team — Firmware Team Member, Waterloo ON. Jan. 2025 - April. 2025

- Implemented SPI communication between STM32 and ERCK 05SPI 360 encoder.
  - Utilized logic analyzer to capture and debug digital signal traces.

Hardware Test Intern — StandardBioTools, Markham ON. Sept. 2024 - Dec. 2024

- Conducted lifecycle testing by integrating a pneumatic actuator and camera system to automate physical testing and validate results.
  - Developed a script to manage the process, ensuring autonomous operation and automated result collection.
- Analyzed and certified five gas manifolds by performing leak checks, pressure sensor accuracy tests, and MFC precision and resolution analysis.
  - Authored Project Change Requests to address design issues and improve designs.
  - Led supplier meetings to resolve MFC inconsistencies and streamline communication.
  - Developed Python scripts to automate data collection for pressure sensors, flow rates, and leak detection.

Manufacturing Engineering Intern — Greenhouse Juice Co. Mississauga ON. Jan. 2024 - April. 2024

- Integrated the NIMCO Gable Top machine into production, increasing juice production by 10%.
  - Engineered custom jigs and developed UV monitoring protocols for precise liquid flow control.
  - Created an SOP and trained operators for consistent implementation.
- Developed a hydrogen peroxide detection system using OAK-1 PoE and Raspberry Pi 5, enabling real-time monitoring, LED updates, and automated Excel logging.
- Monitored machinery data, performed daily water titration tests, and tracked gas, water, and electricity consumption to optimize resource usage.

Controls Specialist Intern — JMP Solutions, Oakville ON. May. 2023 - Sept. 2023

- Developed and programmed PLCs to regulate the drive speed of two KOBM slurry pumps for ArcelorMittal Dofasco, optimizing operational efficiency.
- Collaborated closely with the Vice President and General Manager of Integration and Engineering Services to successfully complete a corporate-wide file management initiative.
- Drafted nine x-axis motion and nine z-axis motion drives to control multi-cut saws used for cutting exhaust pipes of varying lengths for ArcelorMittal Dofasco.

Projects

Inventory Tracker App

- Built a React Native Expo Go app for wine inventory at Malivoire with dynamic search/add/delete functionality, AsyncStorage persistence, and automated Excel report export.

Two-Axis Motion School Project

- Designed and implemented a precise two-axis STM32 motor control system using ADCs, potentiometers, and interrupts, achieving accurate X/Y motion.

Modelling Segway – SimulationX

- Simulated and optimized Segway motion using Simulink and SimulationX, developing a 3D experimental model and tuning key variables to achieve a stable 5.18 m forward displacement within speed limits.

Thermopile Sensor Design

- Built a thermopile with 3D-printed holder and op-amp circuit, achieving ±1.5°C measurement accuracy.

Education

University of Waterloo — Candidate for Bachelors of Mechatronics Engineering. Sept. 2022 - Present
Secondary School — Graduated with honours diploma and 98% average Sept. 2018 - June. 2022